



hp storage

july 2002

SAN
technical blueprint

NAS on SAN

executive summary

This paper presents an HP technical Solution Blueprint for merging Network Attached Storage (NAS) and Storage Area Network (SAN) configurations into a single pool of storage. Hp calls this Universal Networked Storage. SAN and NAS both have their own distinct benefits, and in reality enterprises do need both the file level simplicity of NAS and the block level performance on SAN. However by merging NAS and SAN together - i.e. by running both NAS and SAN in the same centrally managed storage pool – IT managers can expect to get increased efficiency, and to improve levels of availability and backup on their NAS storage.

Storage Solution Blueprinting is HP's concept of defining a configuration for a specific storage problem, and providing all the information necessary to implement. A blueprint represents a fully tested and supportable configuration, which is orderable as a set of individual components from HP's standard price list. Recognizing that one size does not fit all, guidance on flexibility and scalability is given. Standard product support is provided for each component in a blueprint configuration, although custom implementation and support services are also available.

The blueprints are split into two levels – business and technical. The business blueprint is intended as a first-level guide that defines a storage problem, demonstrates what type of storage solution can solve that problem, and recommends an HP configuration. The technical blueprint provides the next step by giving detailed schematics and parts-lists to enable the recommended configuration to be implemented.

today's challenges in storage

Rampant growth in quantity of data being stored, stagnant or shrinking IT headcount, and organizations' ever-increasing reliance on access to customer information are the key factors driving storage, and the management of storage, to the top of IT Managers' agendas. Industry analysts and vendors have been positioning networked storage (both SAN and NAS) as the solution to these issues, and end-users have significantly adopted SAN and NAS¹ in place of traditional direct attached storage (DAS)

However there has been an issue with networked storage – competing vendors have positioned NAS and SAN as either/or options and this has lead to confusion amongst end-users. Goldman Sachs² observe:-

"...This debate has somewhat mistakenly positioned NAS file servers, on the one hand, and storage area networks on a dedicated fibre channel network, on the other, as somehow directly substitutable for one another and intended for the same tasks."

¹ Gartner Dataquest; 2001 RAID-Based Disk Storage Worldwide Market Share & Forecast

² Goldman Sachs Global Equity Research – Technology: Storage Networking – Nov 2000

The reality is that enterprises need both NAS and SAN. Hp's storage strategy calls for Universal Networked Storage – where NAS and SAN seamlessly converge.

why an hp solution?

Unlike standard technical “whitepapers”, hp's Solution Blueprints offer a quick time to solution for channel partners and end-users by offering pre-tested solution configurations to specific storage problems. Blueprints also provide the flexibility that is missing in fixed solution bundles. HP has the depth of experience to guide end-users through migration from direct-attached to networked storage.

Finally, the resulting storage solution is only as effective and complete as its component parts. Hp's storage portfolio offers choice and excellence that is second to none. Modular disk and tape offerings scale the need from entry to enterprise level. Leading software provides the layers of virtualization and control, which simplify the management of multi terabytes of data. And a full services offering – from design through implementation, on-going use, and eventual upgrade, ensure that end-users get maximum value out of their investment.

key components

The NAS-on-SAN configuration comprises the hp NAS 8000 NAS head, which can be connected to any one of hp's existing SAN solution blueprints, which are listed in the “deployment & flexibility” section.

The HP NAS 8000 series provides scalable, easy-to-manage, heterogeneous file serving in direct-attached and SAN attached configurations. The NAS optimized OS, and cluster-technology, ensures easy installs, low maintenance, and high uptime.

The HP StorageWorks NAS 8000 series provides scalable, easy-to-manage, heterogeneous NAS solutions in direct-attached and SAN-attached configurations for file-sharing flexibility. With a NAS-optimized OS for file serving and cluster technology for mission-critical needs, these solutions provide easy installation, low maintenance, and high uptime. They are an ideal way for IT managers to scale storage quickly and easily without bringing down servers or disrupting client access to network data.

- **scalable:** extends storage to 15.4 TB attached to VA arrays, higher with XP arrays and SANS
- **high-performance:** serves files at up to 530 Mb/s CIFS
- **available:** maximizes uptime with two-way clustering and redundant, hot-swappable power supplies
- **flexible:** interoperates with Windows 98/ME/XP/NT/2000, UNIX, and Linux clients
- **integrated:** functions with popular system management applications
- **manageable:** provides Web-based GUIs, integrated Command View SDM, and a command line interface
- **comprehensive:** ensures data availability with basic and enhanced network backup and local backup
- **extensive:** interoperates with a wide range of applications for databases, Web serving, and e-mail
- **secure:** has native UNIX and Windows security, universal data locking, integrated virus protection
- **reliable:** is available with 24 x 7 x 365 telephone, Web, support for highest uptime

the solution

Two NAS configurations are available – a non-HA and an HA configuration – each of which can be added to any of the existing hp SAN solution blueprints.

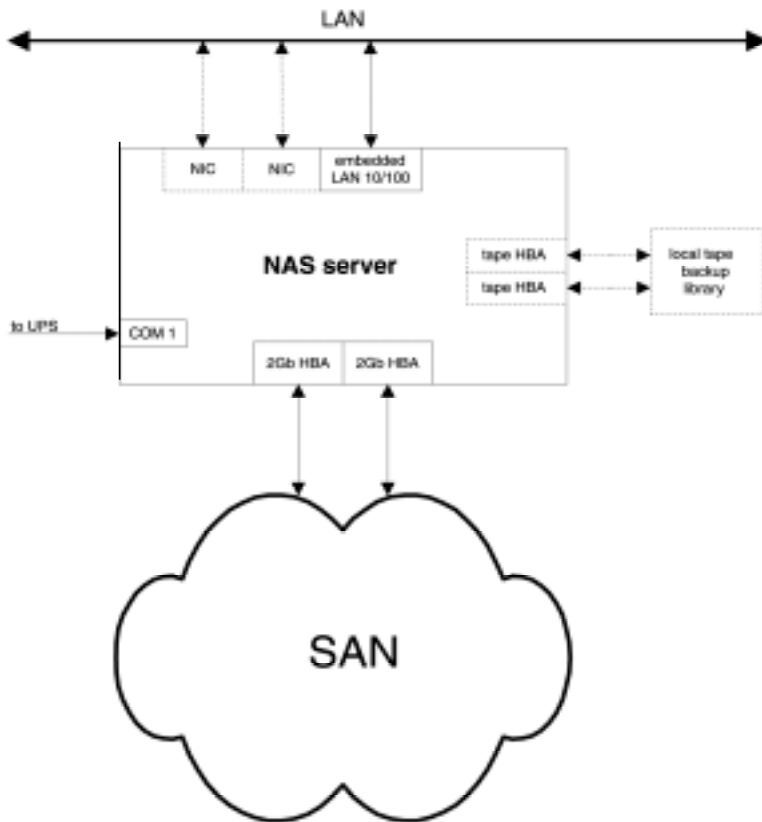
To get a parts-list for each of the NAS configurations, please use hp's Sales Builder for Windows, or contact your hp representative. The NAS configurations are available as single-part numbers for ease of ordering.

non-HA NAS configuration

This configuration provides a low-cost and simple option for adding NAS to a SAN configuration. It comprises a single NAS8000 NAS server, which attaches to the standard messaging LAN via network interface cards and attaches via fibre channel HBAs to the SAN.

Tape backup for the NAS could be provided with a direct-attached tape drive, but would be better using the tape resource on the SAN.

The NAS server will be monitored and managed by the central management station on the SAN – OpenView Storage Node Manager will recognize the NAS server as node on the SAN.

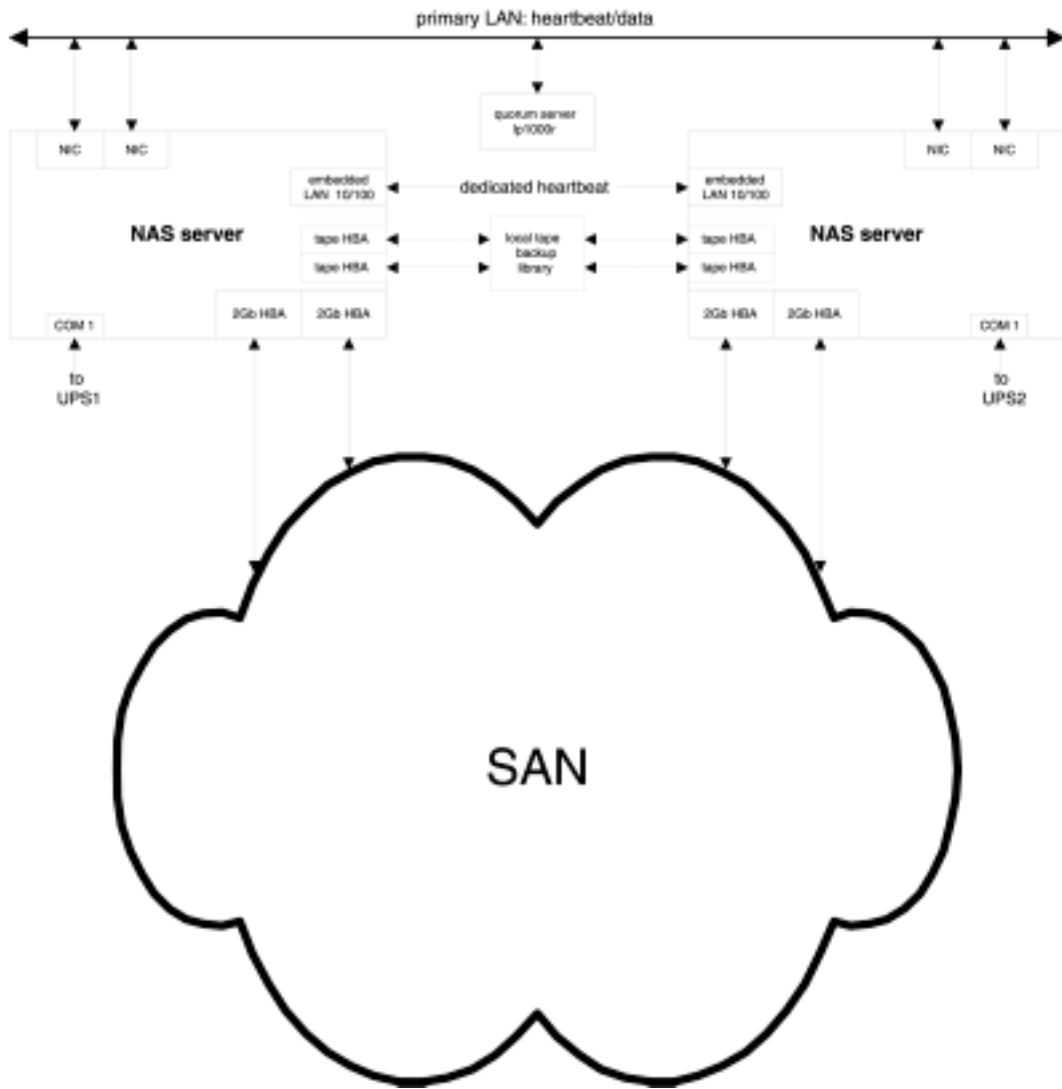


Choose a SAN configuration from any of hp's SAN solution blueprints

high availability NAS configuration

The High Availability NAS configuration comprises dual NAS servers and a "quorum" server in between to provide cluster-locking. The quorum server is an additional hardware component that is required for high availability NAS cluster

configurations. The quorum server enforces the cluster membership policies and ensures data integrity by preventing “split brain syndrome.” Split brain syndrome is an undesirable condition that can occur when the cluster NAS heads are unable to communicate with each other and they are allowed to form independent clusters—each assuming that the other head is down. Serving the same file systems from both cluster NAS heads simultaneously would result in data corruption. The quorum server prevents this from happening by providing cluster arbitration services



Choose a SAN configuration from any of hp's SAN solution blueprints

deployment & flexibility

The NAS8000 can be added to any of the following SAN blueprint configurations

Starter SAN	up to 5 hosts and 288GB capacity
Entry Level SAN	up to 5 hosts and 745GB capacity
Entry Level HA SAN	up to 12 hosts and 1.3TB capacity
Enterprise SAN	up to 50 hosts and 10.9TB capacity
Enterprise HA SAN	up to 25 hosts and 5.2TB capacity

For alternate SAN configurations – i.e. to accommodate legacy installations – please contact your hp representative. Hp offers a comprehensive SAN design and implementation service (listed in the following section) to provide a custom SAN installation.

Customers would also benefit from using hp's OpenView Storage Area Manager implementation service (H9142A), which provides installation, configuration, documentation, and demonstration of HP's SAN management software solution.

additional information

SAN solutions

Additional HP SAN Solution technical blueprints - www.hp.com/go/storage_blueprint

Entry-level SAN (includes Starter SAN)

Entry-level HA-SAN

Enterprise SAN

Enterprise HA SAN

For more business-level information on the benefits a SAN can bring your company, take a look at our SAN Solution business blueprints – www.hp.com/go/storage_blueprint

Storage Efficiency

High Availability

Starter SAN

Open Storage Management

To get answers on further SAN implementation questions contact your HP sales representative who will be able to consult our regularly updated SAN interoperability matrices and provide guidance on additional OS, fabric topology and 3rd party/legacy device interoperability.

hp SAN components

To get further information on the individual components in an HP SAN, go to www.hp.com/go/storage

hp services

A full range of services are available including planning your SAN, implementing your SAN, and evolving your SAN as your needs change. For full details see www.hp.com/go/4service. Available services include:

design and implementation services

We provide our expertise and experience to assist you in creating your SAN architecture. We then help you implement your SAN and provide additional services in critical areas such as SAN management, data protection, and quick recovery. Product specific services are also available.

operate and evolve services

Support services range from aggressive, proactive Mission Critical services to a range of reactive services (8x5 3-day response to 24x7, same day response with 6-hour Call-to-Restoration commitments). We will analyze the performance and capacity usage of your storage environment including all major system components. You will receive a detailed Performance and Capacity report with recommendations how to tune your performance and optimize your capacity usage.

data migration services

We offer a stress-free data migration from mission critical HP-UX, Windows NT/2000, SUN legacy and EMC storage systems to the HP Surestore SAN platform based on an end-to-end management of the entire data migration process.

storage/SAN integration services

HP also offers Storage/SAN integration services, which provide a trouble-free and quick on-site installation of your SAN solution. For full details see www.hp.com/hps/gds, as an outline, this service provides:

- Physical integration of the selected SAN systems in a factory environment.
- Installation and verification of Storage Software
- Utilizes procedures developed and proven in HP's extensive experiences delivering storage solutions
- Dedicated project manager as your single point of contact
- Complete solution documentation, presentation and repackaging
- Synchronization of shipment with planned date of installation

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